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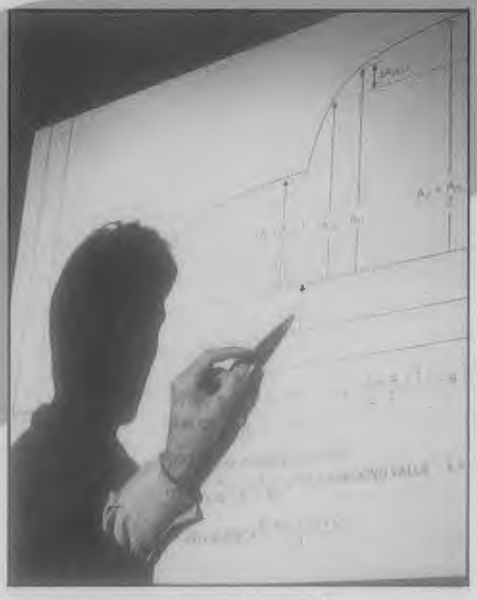

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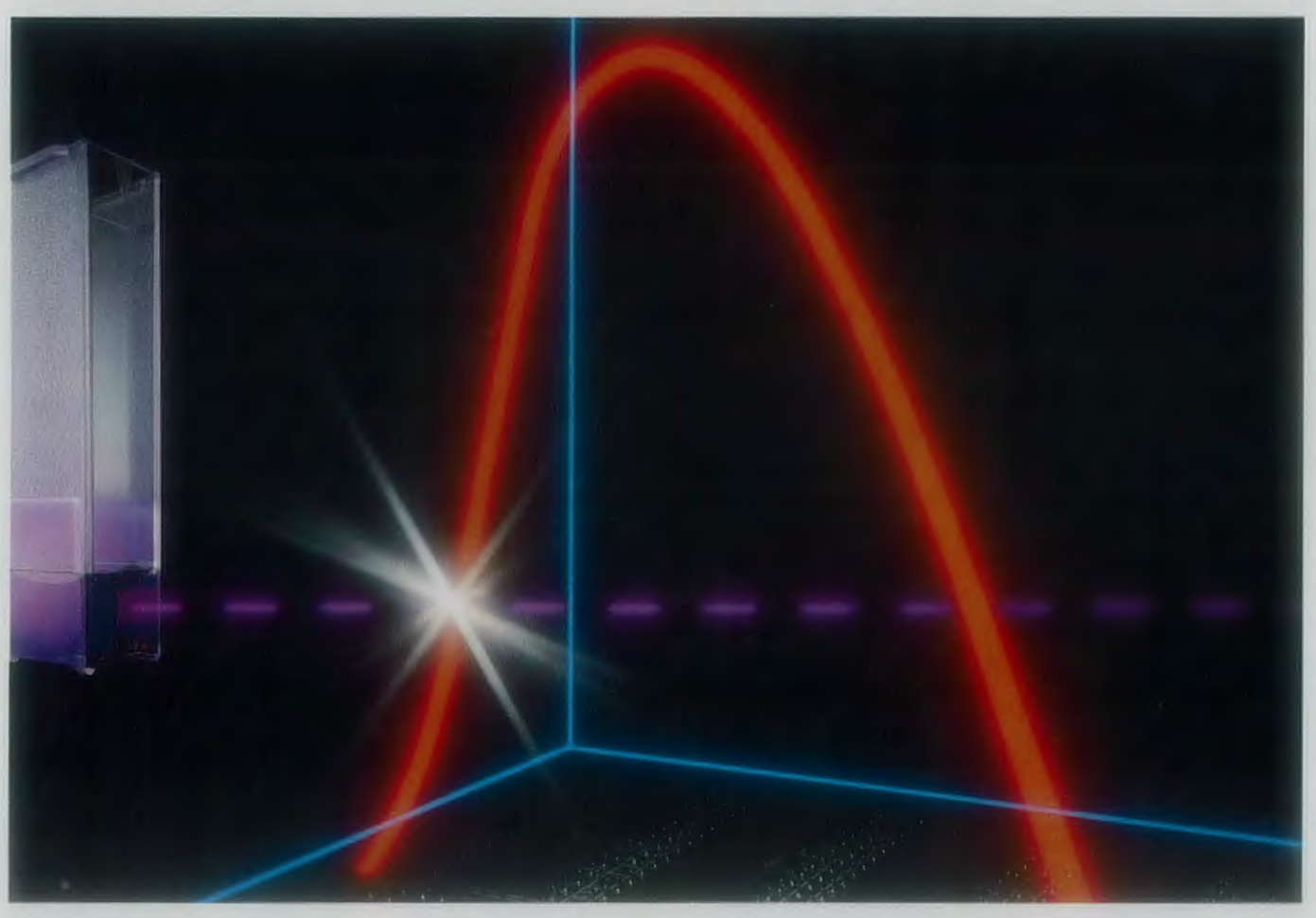

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Rationale for and Development of a Data Management System for Smaller Laboratories using Networked Micro-Computers

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Abstract

Computerisation of smaller general purpose laboratories poses a range of problems that are not currently met by available software systems. The relatively small volume of data from a broad range of analyses, coupled with limited available finance for capital outlay, compounds the decision making process of balancing the advantages and disadvantages of electronic data management (EDM). There is an inverse ratio between data volume and the benefits of EDM.

The problem has been tackled at Wairau Hospital over the last three years, the outcome of which is a very versatile data management system operating on networked micro-computers. The system is stand-alone, and fully IBM compatible. Its modular design permits staged introduction. It is commercially available and is backed by this laboratory which is maintaining an ongoing development programme exploring the full potential of the system.

Introduction

Over the last ten years productivity per staff member in laboratories has increased by at least fifty percent, even in smaller laboratories, as the introduction of scaled down automation has impacted on the profession. Developments in this area have largely plateaued for the time being except in the field of data management systems suited to the needs of smaller laboratories. Recent advances in microcomputer development are now opening up the area of data management for smaller units in much the same way that mini-and mainframe computers have become an integral part of the large laboratory scene.

Computers are essentially number crunching devices able to collect, sort and manipulate large blocks of data. The larger the volume to be processed, the greater the benefit gained. The converse also applies; a fact which makes any decision concerning computerisation somewhat more complex for those of us with smaller volumes of data gleaned from an almost equally broad base of test range. Finding an acceptable balance between costs of a system and the benefits gained is not an easy task. It is helpful to have an overview of the computer scene, without becoming absorbed in too much detail. The subject is briefly examined here under the heading of Commodity, Control, Capability, Compatibility and Cost.

The Commodity

The computer hardware scene is in a continual state of flux. There is always something smaller, faster, with greater capacity and versatility being developed. At some point it is necessary to stop looking at the ever increasing array of hardware and make a committment to a system. The catch is when to make this decision. A wrong decision at this point will result in being stranded in an electronic backwater, out of touch with the fast moving mainstream of developments. It is at this point that an overview of the whole scene is most helpful.

There are three main streams of development, mainframe, mini-, and micro-computers. At the moment these three streams are running in parallel, each fulfilling a specific role in the marketplace. The three streams are increasingly merging and interlocking, (they are not necessarily mutually antagonist). It is probable that the merger will be strongest between mainframe and micro-computers.

Clusters of micro-computers can be networked together to form a higherly flexible stand-alone environment. These clusters can now be linked with other clusters through a common bulk database, without loss of independence. This type of system has the best of both worlds.

Control

Computers are supposed to be servants, not masters. Unless properly controlled, they tend to become inflexible and unforgiving taskmasters. Control is gained through software, the system that drives the various components of the hardware package. Selection of software is the key to successful control.

A computer system must be tailored to suit the environment, not the reverse. The environment varies considerably between laboratories, depending on location and services provided. For smaller laboratories there is not much software to choose from.

Ensuring that computers remain servants is achieved by selecting highly flexible software. Flexibility is a measure of a systems ability to perform a wide range of tasks and the degree to which an operator is able to change the system. The more areas within a system that are "user defined", i.e. may be changed by the operator, the greater the flexibility of the system.

Capability

The most flexible data management system is the totally manual one; it is possible to make any changes at any time (often unintentionally). Any manual system soon becomes unwieldy, particularly when cumulative data is required.

A software package being considered for smaller laboratory use must have maximal flexibility. Without this there is insufficient gain in productivity to warrant the substantial outlay of capital required. For a smaller hospital laboratory there are seven basic requirements.

1. A single data entry station for all patient demographics and requests.
2. There must be automatic collation of analyser-generated data with patient demographics.
3. Report generation must be cumulative for inpatients and one-off for most private patients.
4. Worksheet and report generation options must be readily accessible to permit easy change to format.
5. Quality control reports, workload statistics and cost analysis must be automatically cumulative.
6. The system must be fully IBM compatible.
7. The system should be able to link with the national patient management system for automatic admission and discharge.

Compatibility

No decision about computerisation can be made in isolation. It is essential to be aware of and in tune with what is being planned for the institution as a whole. Within the hospital system, the national mainframe linkage potential must be considered. Compatibility with the total system is essential but this does not have to be achieved through acceptance of a less than satisfactory laboratory package. The best option available to laboratories in the medium to small bracket, is a stand-alone system that is capable of offloading completed bulk data into a shared database, be it mini- or mainframe (both are now technically feasible). This approach permits greater internal flexibility and avoids the inevitable delays incurred when having to continually access a shared database.

The prospect of linking stand-alone networked micro-computer systems with the existing national mainframe

system radically changes the current outlook for provincial hospital laboratories.

Cost versus Benefit

The key to successful balancing of the cost/benefit equation are:

1. Interfacing of analysers.
2. Networking of departmental terminals together.
3. A central patient data entry station.
4. A common file server, that acts as a small working database.

The limiting factor for any system is the rate at which data must be entered into the system by keyboards. The proportion of data must be entered in this way is higher in small laboratories. No time is gained if analyser data must be keyed into the database, or if each section has to enter its own patient demographics.

Any move to computerisation must reduce the clerical load, reduce transcripton errors and save significant technical time.

The cost of the exercise must be kept in proportion to the benefits gained by the institution as a whole. Hence the need for a careful analysis of smaller hospital requirements.

The system developed at this hospital more than meets the basic criteria in terms of capability and in addition remains eminently affordable.

The System

Several factors combined to set this laboratory on a course involving a substantial committment to computerisation. Decreasing allocations of funds with little prospect of a reversal, plus an increasing workload has made increased productivity a priority; the alternative of a reduction in services is not considered a valid option. Since there was no commercially available system suited to the smaller laboratory environment, it was decided to develop an in-house system from scratch using the programming expertise gained by staff with an interest in computers and capitalising on the powerful potential of newly released software packages designed for business use. The system runs on "REVELATION" software, a derivative of the PICK operating system used by some mini-computers, and which greatly extends the capacity of microcomputers. This capacity can be further enhanced by networking a number of microcomputers together through a common file server. Networking provides a shared pool of patient information and a rapidly accessible working database which is kept small by automatic archiving of aged data. The small database reduces search time, allowing faster routine operation; archived data can be recalled readily. The system is fully IBM compatible and can be mainframe linked, a development that combines the best of both worlds, i.e. a fast, stand-alone system with massive bulk data storage capacity.

The system is modular, by department, which permits gradual implementation throughout the laboratory. Currently modules for Haematology, Biochemistry and Microbiology are available, either individually or as a combined package. There are a number of features common to all the modules each of which also has a wide range of features relevant to the discipline.

Shared features include a common patient database, data retrieval by seven search keys (name, hospital or lab number, doctor, age, admission date, part name), automatically timed routine data management functions, full archiving and enquiry facilities, cumulative and individual report generation, a wide range of user definable formats, many help facilities on all entry fields, screen displays of work status, automatic Q.C. and management data collation. The system has been copyrighted under the name LAB-LINK with appropriate title variations for the separate modules.

HAEM-LINK, the haematology module, has a number of features including, user defined worksheets, cell counter data collation with in-line deletion or correction facilities, differential counting via keyboard and free text film comment space with patient counter results on screen, reticulocyte counting facility, add test facility, age and sex related reference ranges, and an associated coagulation module and serology module.

CHEM-LINK, the biochemistry module, features on-screen autoanalyser worksheets and printouts for manual tests (both user definable), batch status screens, patients test status on demand facility, hold back facility for incompleted work, age and sex related reference ranges. External computer control of analysers is possible, the system can be interfaced to any analyser with an RS232 port. For the scale of operation at this hospital, it has been necessary to have a second terminal in the department to handle the volume of data generated from tests not performed on the autoanalyser.

MICRO-LINK, the microbiology module, features a range of user defined standard report formats, user defined result entry screens that minimise keyboard data entry per patient, a rapid organism selection facility, ample free text space, a nosocomial report monitoring facility, and serial test status reports for long incubation cultures.

Figure 1 summarises the layout of the system at Wairau Hospital.

The system is now commercially available. It is backed by a team of technologists and programmers based in a laboratory that has an ongoing development programme exploring the full potential of the system. It is already apparent that networked microsystems have enormous potential now that they can be integrated with large external databases. This potential is being actively explored as the team begins to focus its attention outside the laboratory environment to wards, private surgeries and other areas in the hospital service.

Being well aware of the widely differing needs of the public and private sector service users through this laboratory's involvement in both, the team is geared to tailor its software to individual requirements. It is also well placed to support and service any installation through modem linkages to its home base laboratory. As the effectiveness of any system can only be accurately assessed by on-site inspection, this laboratory welcomes visits by interested individuals by arrangement at mutual convenience.

Acknowledgements

We are indebted to the staff of Wairau Hospital Laboratory for their patience and endurance throughout the tedious development stages, and to the Executive and Members of the Marlborough Hospital Board for their trust and support of the venture.

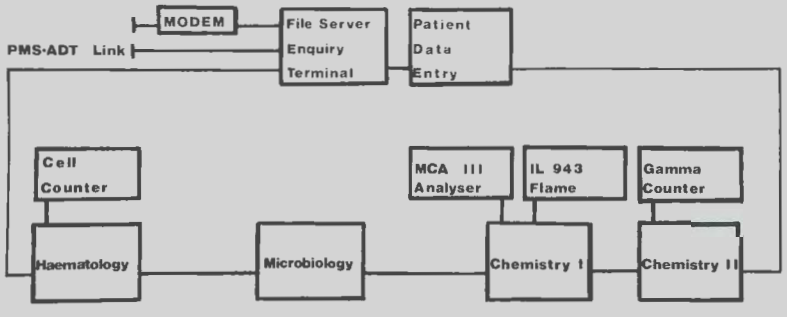

Fig.1 Schematic layout of Lab-Link System : Wairau Hospital

The 'In Vitro' Susceptibility to Sulbactam/Ampicillin of Aerobic and Anaerobic Clinical Isolates.

Brian Currie

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Abstract

The 'in vitro' susceptibility to sulbactam/ampicillin of 575 ampicillin resistant organisms isolated from clinical specimens was determined by agar dilution. Sulbactam/ampicillin was shown to be active against a broad range of aerobic and anaerobic organisms including some strains of methicillin resistant *Staphylococcus aureus* (MRSA).

Introduction

Sulbactam is a derivative of the basic penicillin nucleus. It is an irreversible inhibitor of several B-lactamases, especially types II, III and V, and the cephalosporinases of *Bacteroides fragilis* and *Legionella pneumophilia* (1, 2). Alone sulbactam has minimal antibacterial activity, though it has been shown to be active against members of the Neisseriaceae (3, 4, 5). However a marked synergistic effect has been noted when administered together with ampicillin (6).

Ampicillin is the bactericidal component of the combination, and acts during the stage of active multiplication by inhibiting biosynthesis of cell wall mucopeptides. Previous overseas studies reveal that sulbactam/ampicillin is active against a wide range of ampicillin resistant hospital isolates with greater than 90% being inhibited by a combination of sulbactam and ampicillin containing 8-16 mg/L of ampicillin (6, 7).

It was decided to determine the susceptibility of local isolates to sulbactam/ampicillin.

Methods and Materials

The organisms used were isolated from clinical material over a six month period at the Palmerston North Hospital. Resistance to ampicillin was determined by disc diffusion (8). Sulbactam sodium and ampicillin sodium were obtained from Pfizer NZ Limited in the dry form and stored at 4°C before use. Sulbactam and ampicillin were used in 1:1 ratio and final concentrations were made in agar plates in accordance with the methods described in the Manual of Clinical Microbiology 4th edition (Lynette and Truant) (9). The medium used was Mueller-Hinton agar with 5% lysed horse blood. The range of antibiotic tested was 0.25 mg/L - 128 mg/L.

The organisms were grown in Tryptic Soy Broth and appropriate dilutions were made to give a final concentration of 10^5cfu/mL. A LEEC replicator was used to inoculate the plates.

The minimum inhibitory concentration (M.I.C.) was determined as the lowest concentration of antibiotic to show complete inhibition.

Results

Table 1 shows the MIC and accumulative susceptibility of 575 isolates to sulbactam/ampicillin. The manufacturers guidelines recommend an M.I.C. of >16 mg/L should be regarded as resistant though some workers suggest that ≥32 mg/L should be used for urinary isolates.

From Table 1 it can be seen that the M.I.C. 90 of all isolates tested is ≦16 mg/L.

Discussion

It is of importance to note that organisms that are resistant to ampicillin by mechanisms other than penicillin degrading

Table 1

ORGANISM	NUMBER	M.I.C. in mg/L										
		0.25	0.5	1	2	4	8	16	32	64	128	>128
Staphylococcus aureus	224		1	23	62	92	42	3*	1*			
Staphylococcus epidermidis	49		8	8	1	13	11	6	1	1		
E. coli	107				4	14	23	40	22	3	1	
Klebsiella pneumoniae	76				1	12	33	15	14	1		
Klebsiella oxytoca	21					6	10	4	1			
Klebsiella ozaenae	1							1				
Morganella morganii	12						3	5	4			
Proteus vulgaris	5					1	4					
Proteus mirabilis	4				1	1	2					
Enterobacter species	20					3	1	4	9	3		
Citrobacter species	9					4	3		1	1		
Serratia marsescens	7								5	2		
Hafnia alvei	2							2				
Edwardsiella tarda	1					1						
Acinetobacter calcoaceticus												
bio lwoffi	5									1	2	2
bio anitratus	5			1	4							
Haemophilus influenzae	4					2	1					1
Branhamella catarrhalis	6	3	3									
Bacteroides fraglis	13		1	7	3		1	1				
Bacteroides thetaiotaomicron	2			1	1							
Bacteroides ovatus	2			1	1							
TOTAL	575	3	14	41	77	149	134	81	58	12	3	3
ACCUMULATIVE %		0.5	3	10	23	49	73	87	97	99		

* Methicillin resistant (4 strains)

enzymes are unlikely to be sensitive to sulbactam/ampicillin. This is illustrated in the case of *Haemophilus influenzae* (Table 1). 3 isolates were B-lactamase producers whilst 1 resistant isolate (128 mg/L) was a non-B lactamase producing ampicillin resistant strain.

It is of interest that of the two biotypes of *Acinetobacter calcoaceticus* it is the anitratus biotype that is the more sensitive. This is important in light of previously reported studies suggesting *Acinetobacter anitratus* is the biotype most likely to be involved in infection (10), particularly as an opportunist in compromised patients.

All strains of *Bacteroides species*, *Staphylococcus aureus* (other than *MRSA*), *Branhamella* (Moraxella) *catarrhalis* and B-lactamase producing *Haemophilus influenzae* were sensitive to the sulbactam/ampicillin combination containing 16 mg/L of ampicillin, as were most strains of *Staphylococcus epidermidis* and the Enterobacteriaceae. Most strains of *Enterobacter* species and *Serratia marsescens* were resistant at this level. These findings are similar to those in previously published data.

Acknowledgements

I wish to thank Pfizer NZ Limited for supplying the antibiotic and technical data. I also wish to thank the typists at the Palmerston North Pathology Department for persevering with my writing and transforming it into legible script.

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Comparison of Five Commercial Methods for the Identification of Non-fermentative and Oxidase Positive Fermentative Gram Negative Bacilli.

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Abstract

Five commercial kit systems, API 20E, API 20NE, [Oxi-Ferm tube] II Roche, Microbact 24E and Minitek were evaluated to determine their ability to identify 100 non-fermentative and oxidase positive fermentative organisms isolated from clinical material over a period of 14 months.

All *Pseudomonas aeruginosa* which produced pigment on routine culture media were excluded from this study because of the ease with which these organisms can be identified using simple microbiological techniques.

API 20NE identified 87% of the isolates; Minitek, 80%; [Oxi-Ferm tube] II Roche, 71%; Microbact 24E, 66%; API 20E, 56%.

The ability of each system to identify three commonly encountered organisms — *Pseudomonas aeruginosa, Pseudomonas maltophilia*, Acinetobacter sp — was also determined. [Oxi-Ferm tube] II Roche identified 98%, API 20NE, Minitek, 88%; Microbact 24E, 77% and API 20E, 70%.

The kits were assessed primarily on accuracy of identification.

Introduction

The gram negative non-fermenting and oxidase positive fermenting bacteria are increasingly implicated as causes of human disease, particularly as opportunistic pathogens of the compromised host (2). It is therefore important that the laboratory has access to a rapid and reliable method for identifying these organisms.

Recently a number of commercial systems have become available which offer an alternative to the conventional methods by allowing rapid (24-28 hour) and in some cases computer-aided identification. The purpose of this study was to compare the ability of the five commercial systems — API 20E, (API Systems S A, France), API 20NE (API Systems S A, France), Minitek (Beckton-Dickinson, Rutherford, N J), Microbact 24 E (Disposable Products PTY LTD, South Australia), [Oxi-Ferm tube] II Roche (Hoffmann-La Roche INC, Basle, Switzerland) — to identify non-fermentative and oxidase positive fermentative bacteria obtained from patients in Auckland Hospital over a 14 month period. We compared the accuracy of these results with those obtained by a conventional method (7).

Three commercial systems, API 20E, Minitek and [Oxi-Ferm tube] II Roche have been evaluated and reported in the literature and have correctly identified at least 90% of the *Pseudomonas aeruginosa* and Acinetobacter sp (1, 3, 4, 5, 6), but to our knowledge there had not been any published data evaluating API 20NE or Microbact 24E for identification of miscellaneous gram negative bacilli.

Materials and Methods

BACTERIA

A total of 100 organisms isolated over a 14 month period from specimens routinely encountered in the Department of Clinical Microbiology at Auckland Hospital were collected and stored at -70°C in skim milk. All strains were subcultured three times onto horse blood agar and incubated at 35°C before being tested.

Pseudomonas aeruginosa producing pigment on routine media (MacConkey, Mueller Hinton or Horse Blood Agar) were excluded from this study. The 16 *P. aeruginosa* tested represented slow pigmenting, apyocyanogenic or mucoid strains.

Table I *Accuracy of API 20E in comparison with conventional method*

	Total No.	Correct	Correct to Genus	Unidentified	Misidentified to Genus	Misidentified to Species
P. aeruginosa	16	10	0	6	0	0
P. maltophilia	21	17	0	4	0	0
P. putida	9	3	4	2	0	0
P. stutzeri	4	1	0	1	0	2
P. fluorescens	3	2	0	1	0	0
P. cepacia	3	2	0	1	0	0
P. vesicularis	2	0	0	0	1	1
P. putrefaciens	1	0	0	1	0	0
A. anitratus	14	7	1	5	1	0
A. lwoffi	6	3	2	1	0	0
**M. lacunata*	NA	NA	NA	NA	NA	NA
Moraxella sp.	7	6	NA	0	1	0
**Alc. odorans*	NA	NA	NA	NA	NA	NA
**Alc. faecalis*	NA	NA	NA	NA	NA	NA
**Alc. denitrificans*	NA	NA	NA	NA	NA	NA
Alcaligens sp.	6	3	NA	2	1	0
Achromobacter sp.	3	1	0	2	0	0
**Ach. xyloseoxidans*	NA	NA	NA	NA	NA	NA
F. meningosepticum	1	0	1	0	0	0
Flavobacterium sp.	1	1	0	0	0	0
CDC Gp II f	1	0	0	1	0	0
**EF-4-B*	1	0	0	1	0	0
**Past. haemolyticas*	1	0	0	0	0	1
TOTALS	100	56	8	28	4	4

* Organism not in systems data base.

CONVENTIONAL METHODOLOGY

All strains were carefully characterised by the criteria and procedures recommended by the Centres for Disease Control (7).

COMMERCIAL SYSTEMS

All systems were inoculated and read according to the manufacturer's instructions.

Supplementary tests were performed when specified. The supplementary tests used were:- growth at 42°C, gelatin liquification, motility (hanging drop), flagella stain, growth on cetrimide agar, reduction of nitrates to nitrogen, catalase, maltose fermentation, metabolism of glucose, growth on MacConkey agar and sensitivity to amikacin, carbenicillin, penicillin, tetracycline or tobramycin.

For API 20E and API 20NE identification was achieved using their respective Analytical Profile Indices. Code numbers not found in these indices were referred via the distributors to the API Computer Reference Centre. Identification was dependent on a profile code achieving at least a GOOD rating.

[Oxi-Ferm tube] II Roche identification was achieved by reference to the Profile Code Book — Coding and Identification System for [Oxi-Ferm tube] II Roche (1984).

Table II *Accuracy of the API 20NE System in comparison with conventional methods*

	Total No.	Correct	Correct to Genus	Unidentified	Misidentified to Genus	Misidentified to Species
P. aeruginosa	16	15	0	1	0	0
P. maltophilia	21	19	0	2	0	0
P. putida	9	8	0	0	0	1
P. stutzeri	4	4	0	0	0	0
P. fluorescens	3	3	0	0	0	0
P. cepacia	3	2	0	1	0	0
P. vesicularis	2	1	0	1	0	0
P. putrefaciens	1	1	0	0	0	0
A. anitratus	14	14	0	0	0	0
A. lwoffi	6	5	0	0	0	1
M. lacunata	4	3	1	0	0	0
Moraxella sp.	3	3	NA	0	0	0
Alc. odorans	3	2	0	0	1	0
Alc. faecalis	1	0	0	1	0	0
Alc. denitrificans	2	2	0	0	0	0
Alcaligens sp.	NA	NA	NA	NA	NA	NA
Achromobacter sp.	1	1	0	0	0	0
Ach. xyloseoxidans	2	1	0	0	1	0
F. meningosepticum	1	1	0	0	0	0
Flavobacterium sp	1	1	0	0	0	0
CDC Gp II f	1	0	0	0	1	0
*EF-4-B	1	0	0	0	1	0
Past. haemolyticas	1	1	0	0	0	0
TOTALS	100	87	1	6	4	2

* Organisms not in systems data base

Table IV *Accuracy of the Microbact 24 E in comparison with conventional methods*

	Total No.	Correct	Correct to Genus	Unidentified	Misidentified to Genus	Misidentified to Species
P. aeruginosa	16	15	0	1	0	0
P. maltophilia	21	13	0	6	0	2
P. putida	9	9	0	0	0	0
P. stutzeri	4	0	0	1	2	1
P. fluorescens	3	2	1	0	0	0
P. cepacia	3	1	0	2	0	0
P. vesicularis	2	0	0	1	1	0
*P. putrefaciens	1	0	0	1	0	0
A. anitratus	14	11	0	1	0	2
A. lwoffi	6	5	0	1	0	0
*M. lacunata	NA	NA	NA	NA	NA	NA
Moraxella sp.	7	7	NA	0	0	0
Alc. odorans	3	0	3	0	0	0
Alc. faecalis	1	1	0	0	0	0
*Alc. denitrificans	NA	NA	NA	NA	NA	NA
*Alcaligenes sp.	2	0	0	0	1	1
*Achromobacter sp.	1	0	0	1	0	0
Ach. xyloseoxidans	2	0	0	2	0	0
*F. meningosepticum	NA	NA	NA	NA	NA	NA
Flavobacterium sp.	2	2	0	0	0	0
CDC Gp II f	1	0	0	0	1	0
*EF-4-B	1	0	0	1	0	0
Past. haemolyticas	1	0	0	0	1	0
TOTALS	100	66	4	18	6	6

* Organisms not in system data base

Microbact 24E consisted of a 12A strip used in conjunction with a 12B strip. Identification was achieved using the Microbact Computer Aided Identification System and software package System 2. Identification was dependent on a high reaction score. Those organisms which had a low reaction score, were uncoded, or not in the data base, were classified as UNCODED.

Table III *Accuracy of the [Oxi-Ferm tube] II Roche in comparison with conventional methods*

	Total No	Correct	Correct to Genus	Unidentified	Misidentified to Genus	Misidentified to Species
P. aeruginosa	16	15	0	1	0	0
P. maltophilia	21	21	0	0	0	0
P. putida	9	9	0	0	0	0
P. stutzeri	4	3	1	0	0	0
P. fluorescens	3	2	0	0	0	1
P. cepacia	3	2	0	1	0	0
P. vesicularis	2	0	0	0	2	0
P. putrefaciens	*	0	0	0	1	0
A. anitratus	14	9	5	0	0	0
A. lwoffi	6	5	1	0	0	0
M. lacunata	4	0	0	0	4	0
Moraxella sp	3	2	NA	0	1	0
Alc. odorans	3	0	0	3	0	0
Alc. faecalis	1	0	0	0	1	0
Alc. denitrificans	2	0	0	2	0	0
Achromobacter sp.	1	0	0	1	0	0
Ach. xyloseoxidans	2	2	0	0	0	0
F. meningosepticum	1	0	0	0	1	0
Flavobacterium sp.	1	0	0	0	1	0
CDC Gp II f	1	1	0	0	0	0
*EI-4-B	1	0	0	0	1	0
Past. haemolyticas	1	0	0	0	0	1
TOTALS	100	71	7	8	12	2

* Organisms not in systems data base

Minitek used the same equipment and procedures as their Enterobacteriaceae system. Substrates used were those recommended by the manufacturers for the identification of non-fermentative and miscellaneous bacteria. Identification was achieved with reference to the Minitek Primary and Secondary Determination Schemes which take the form of reaction tables.

IDENTIFICATION OF ORGANISMS

Identification to species level was not the only criterion for a "correct" answer. Where speciation was offered by an individual system, this was required for a correct answer e.g. *Moraxella lacunata, Flavobacterium meningosepticium.* When speciation was not offered, identification to genus level only was considered correct.

Results

No attempt has been made to compare individual reactions between systems because of the different composition of the various substrates. Biochemical reactions for individual strains are available from the authors.

Tables I to V summarise results obtained using each individual system.

Supplementary test results are in Tables VI and VII.

API 20 E fully identified 56% of the organisms to the level indicated in Table I. A further 8% in which speciation was offered were identified to genus level only — (4 *P. putida* identified as Pseudomonas sp; 1 *A. anitratus* and 2 *A. lwoffi* identified as Acinetobacter sp, 1 *F. meninogosepticum* identified as Flavobacterium sp.)
28 were uncoded or had an unacceptable

Table V *Accuracy of the Minitek in comparison with conventional methods*

	Total No.	Correct	Correct to Genus	Unidentified	Misidentified to Genus	Misidentified to Species
P. aeruginosa	16	12	3	1	0	0
P. maltophilia	21	21	0	0	0	0
P. pudita	9	8	1	0	0	0
P. stutzeri	4	4	0	0	0	0
P. fluorescens	3	2	0	0	0	1
P. cepacia	3	1	0	2	0	0
P. vesicularis	2	0	0	2	0	0
P. putrefaciens	1	1	0	0	0	0
A. anitratus	14	12	0	2	0	0
A. lwoffi	6	5	0	1	0	0
M. lacunta	4	2	2	0	0	0
Moraxella sp	3	3	0	0	0	0
Alc. odorans	3	2	0	1	0	0
Alc. faecalis	1	1	0	0	0	0
Alc. denitrificans	2	0	1	1	0	0
Achromobacter sp	1	1	0	0	0	0
Ach. xyloseoxidans	2	1	0	0	1	0
F. meningosepticum	1	1	0	0	0	0
Flavobacterium sp.	1	1	0	0	0	0
CDC Gp II f	1	1	0	0	0	0
Ef-4-B	1	0	0	1	0	0
Past. haemolyticas	1	1	0	0	0	0
TOTALS	100	80	7	11	1	1

* Organisms not in system data base

Table VI *Number of Organisms for which Supplementary Tests were required for identification with the API 20NE, API 20E, MINITEK and (Oxi-Ferm tube) II Roche*

		Number of Strains Requiring Additional Tests			
	Total No. Strains	API 20NE	API 20E	Minitek	Oxi-Ferm Tube
P. aeruginosa	16		1	8	1
P. maltophilia	21				10
P. putida	9			9	9
P. stutzeri	4		1		
P. fluorescens	3		2		3
P. cepacia	3				
P. vesicularis	2				
P. putrefaciens	1				
A. anitratus	14				10
A. lwoffi	6				5
Moraxella sp.	7	2	6	4	7
Alc. odorans	3	2	2	2	3
Alc. faecalis	1			1	
Alc. denitrificans	2	2		1	2
Achromobacter sp.	1				
Ach. xyloseoxidans	2			1	2
Flabobacterium sp.	2				
CDC Gp II f	1				
E-f-4-B	1				
Past. haemolyticas	1				
	100				

code and 8% were misidentified to genus or species level.
Supplementary tests were required for 12 strains (Table VI) and these tests are listed in Table (VII).

API 20NE — fully identified 87% of the organisms to the level indicated in Table II. A further 1% in which speciation was offered were identified to genus level only (1 *M. lacunata* identified as Moraxella sp). 6% were uncoded or had an unacceptable code and 6% were misidentified to genus or species level.
Supplementary tests were required for 6 strains (Table VI) and these tests are listed in Table VI.

[OXI-Ferm tube] II Roche — fully identified 71% of the organisms to the level indicated in Tabe III. A further 7% in which speciation was offered were identified to genus level only. (1 *P. stutzeri* identified as Pseudomonas sp; 5 *A. anitratus* and 1 *A. lwoffi* identified as Acinetobacter sp). 8% were uncoded and 14% were misidentified to genus or species level. The system repeatedly misidentified *M. lacunata* (4 misidentified as *Pasteurella multocida*).
Supplementary tests were required for 52 strains (Table VI) and these are listed in Table VII.

Microbact 24E — fully identified 66% of the organisms to the level indicated in Table IV. A further 4% in which speciation was offered were identified to genus only (1 *P. fluorescens* identified as Pseudomonas sp; 3 *Alcaligenes odorans* identified as *Alcaligenes faecalis/odorans* group).
18% were either not in the data base or were unidentifiable, i.e. had a low reaction score and 12% were misidentified to genus level.
No supplementary testing is indicated using the Computer Aided Microbact system for miscellaneous Gram negative bacilli.

Minitek — fully identified 80% of the organisms to the level indicated in Table IV. A further 7% in which speciation was offered were identified to genus level only (3 *P. aeruginosa* identified as Pseudomonas sp; 1 *P. putida* identified as Pseudomonas sp; 2 *M. lacunata* identified as Moraxella sp; 1 *Alcaligenes denitrificans* identified as Alcaligenes sp). 10% were not differentiated using the charts provided and 2 strains were misidentified to genus or species level. Supplementary testing was required for 26 strains (Table VI) and these tests are listed in Table VII.

As 57% of the isolates represented only 3 groups of organisms, (*P. aeruginosa*, *P. maltophilia* and Acinetobacter sp), it was of interest to compare the five systems against these organisms as shown in (Table VIII). The systems listed are in rank order.

The remaining 43% of organisms totalled 16 genera and/or species (Table IX). The systems are listed in rank order.

Discussion

The results of a comparative survey can be evaluated on a number of criteria. Assessments can be made on accuracy, rapidity, cost and appropriateness to the individual laboratory.

We have primarily compared the accuracy of the five

Table VII *Supplementary Tests*

API 20E	No. of Strains	API 20NE	No. of Strains	Minitek	No. of Strains	Oxi-Ferm tube II Roche	No. of Strains
Growth at 42°C	4	Growth at 42°C	2	Growth at 42°C	17	Growth at 42°C	13
Maltose	6	Reduction of Nitrates to N_2	2	Gelatin	9	Gelatin	22
Metabolism of Glucose	8	Presence and number of Flagella	2	Motility	5	Motility	32
Flagella stain	2			Denitrification	3	Growth on Cetrimide	5
				Flagella stain	5	Flagella stain	2
				Catalase	1	Amikacin	2
						Carbenicillin	9
						Pencillin	3
						Tetracycline	2
						Tobramycin	2
						Growth on MacConkey Agar	7

systems but some discussion concerning the rapidity is appropriate. API 20NE correctly identified 87% of all the isolates; Minitek identified 80%; [Oxi-Ferm tube] II Roche identified 71%; Microbact 24E identified 66% and API 20E identified 56% of all strains.

As there were no published studies evaluating Microbact 24 or API 20NE at the time of testing no comparison can be made. The accuracy achieved with Minitek, API 20E and [Oxi-Ferm tube] II Roche is at variance with the studies of Appelbaum et al (1) and Oberhofer (3) but comparable to Otto et al (4) and Warwood et al (6). Appelbaum et al, however, did not utilise supplementary tests to complete identification. Oberhofer suggested that API 20E was best suited for the oxidase negative organisms but achieved a 95.3% identification using the Oxi-Ferm system. In our hands the [Oxi-Ferm tube] II Roche identified 71% of all strains — 98% of the commonly encountered organisms but only 49% of the less frequently isolated strains. In particular this system misidentified all the *M. lacanata* and failed to achieve an identification code for the three *Alc. odorans* and two *Alc. denitrificans*. This may reflect the makers choice of supplementary tests.

The rapidity of each system is another important criterion to consider. Although all systems required 48 hours incubation to achieve identification, API 20NE could be read at 24 hours and a reliable identification obtained in this time. It should be noted however that a full 48 hour incubation was frequently required for confirmation of the 24 hour identify. In contrast, when a system had a requirement for supplementary testing, identification was not completed until 72 hours incubation.

[Oxi-Ferm tube] II Roche required supplementary tests to identify 52% of the organisms; Minitek required supplementary tests for 26% of the isolates; API 20E required additional tests for 12% and API 20NE required additional tests for 6% of all isolates.

Two systems did not perform well under test and comment is appropriate. The Microbact 24E reactions were easy to read and the computer-aided code system was an efficient tool, however, we look forward to the up-dating of the miscellaneous gram negative data base which Microbact is proposing. The system should be reassessed when this becomes available.

API 20E is not promoted as an identification system for the non-fermentative organisms but it does have this capacity included in the profile register. It was included in this study because some laboratories may be relying on it for the identification of the non-fermenters. The high percentage

Table VIII *Comparison of 5 Systems for identification of Pseudomonas Aeruginosa, Pseudomonas Maltophilia and Acinetobacter sp.*

— results express as % of number tested ( ).

	P. aeruginosa (16)	*P. maltophilia* (21)	Acinetobacter sp (20)
[Oxi-Ferm tube] II Roche	94	100	100
API 20NE	94	90	95
Minitek	75	100	85
Microbact 24E	94	62	80
API 20E	63	81	65

Table IX *Comparison of 5 Systems for identification of organisms excluding Pseudomonas Aeruginosa, Pseudomonas Maltophilia and Acinetobacter sp.*

— results expressed as % of 43 organisms tested

	%
API 20NE	79
Minitek	70
Microbact 24E	51
[Oxi-Ferm tube] II Roche	49
API 20E	44

(28%) of uncoded organisms would substantiate the view that this system be reserved for the purpose for which it was originally intended — identification of the Enterobacteriaceae.

The choice of a commercial system is at best difficult. API 20NE identified 87% of all organisms and so ranked highest. The time of incubation and number of supplementary tests required again indicated API 20NE to be the most efficient system under test. [Oxi-Ferm tube] II Roche, API 20NE and Minitek successfully identified 98%, 93% and 88% of the commonly encountered organisms (*P. aeruginosa, P. maltophilia* and Acinetobacter sp.)

If these organisms constitute a high proportion of non-fermenters isolated in an individual laboratory, any of these three systems would be acceptable. However, none would be completely satisfactory for a reference laboratory or a laboratory isolating the rarer organisms. For these laboratories the conventional method will remain the reference system.

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Analysis of Publications in the NZ Journal of Medical Laboratory Technology 1972 to 1987

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Introduction

An analysis was made of all original articles and technical communications published in the journal from 1972 to 1987. Excluded were presidential and conference keynote addresses, conference and seminar abstracts, reports, editorials and letters to the editor. The period studied was divided into three five-year periods in order to detect any possible trends. The object of this study was to determine which centres, subjects, authors and laboratories contributed articles to the journal and whether any trend manifested during the last 15 years.

Table 1: *Analysis of main subject categories of papers published 1972 to 1987.*

	1972 to 1977	1977 to 1982	1982 to 1987
Biochemistry	40 (31.7%)	38 (32.8%)	27 (23.3%)
Haematology	16 (12.7%)	15 (12.9%)	17 (14.7%)
Microbiology	30 (23.8%)	24 (20.7%)	22 (19.0%)
Immunohaematology	20 (15.9%)	18 (15.5%)	28 (24.1%)
Histology	2 (1.6%)	2 (1.6%)	4 (3.4%)
Cytogenetics	1 (0.8%)	3 (2.6%)	5 (4.3%)
Other	17 (13.5%)	16 (13.8%)	13 (11.2%)
Total	126 (100%)	116 (100%)	116 (100%)

Results and Discussion

As evident in Table 1, there was a decline in the number of papers published in the areas of biochemistry and microbiology. There was an increase in immunohaematology papers in the period 1982 to 1987 which to a greater extent came from the Auckland Blood Transfusion Centre (see also Table 3). Haematology papers remained constant and included in this category were four papers on coagulation over the 15 year period. There was an increase in cytogenetics papers of which all but one (1972 to 1977) were by DR Romain of the Wellington Hospital Cytogenetics Laboratory. The other categories included the subjects of immunology, management, education and history. Even though there have been changes in format and issues published per year during the last 15 years, the amount of papers published has remained fairly constant.

The editorship of the journal changed in 1983, moving from Dunedin to Auckland. This could have some bearing on the fact that in the last five years there has been an increase in papers published from Auckland although it is similar to their 1972 to 1977 period (see Table 2). The amount of papers from Dunedin increased in the 1977 to 1982 period and has remained at this level. Although there has been a steady increase in papers from the Wellington area, it is still some way behind Auckland and Dunedin, while papers from the Christchurch region show a steady decline throughout the 15 year period. The number of papers from some medium sized centres, such as Palmerston North, Whangarei, Invercargill, Tauranga and Hastings was low in comparison to the total, whilst no papers were published from Napier, Whakatane, Gisborne, Wanganui, Greymouth or Timaru. Other smaller centres than those mentioned have contributed to the journal over the years (see Table 2).

A further breakdown of the type of laboratory publishing papers in the journal shows that the majority of articles understandably were from hospital-based laboratories, and has remained reasonably constant over the years, in contrast to the private laboratories whose output has steadily declined. As can be seen in Table 3 there has been a marked increase in immunohaematology papers originating from the Auckland Blood Transfusion Centre, while the NHI in Wellington has increased its output in the last five years.

	1972 to 1977	1977 to 1982	1982 to 1987
Dunedin	19 (15.1%)	27 (23.3%)	27 (23.3%)
Christchurch	26 (20.6%)	21 (18.1%)	13 (11.2%)
Nelson	2 (1.6%)	6 (5.2%)	1 (0.9%)
Wellington	8 (6.3%)	17 (13.5%)	18 (15.5%)
Palmerston North	3 (2.4%)	4 (3.4%)	0 (0%)
New Plymouth	2 (1.6%)	9 (7.1%)	6 (5.2%)
Hamilton	15 (11.9%)	9 (7.1%)	10 (8.6%)
Auckland	40 (31.7%)	21 (18.1%)	39 (33.6%)
Overseas	5 (4.0%)	3 (2.6%)	4 (3.4%)
Other Centres	9 (7.1%)	4 (3.4%)	4 (3.4%)
Total published papers	126	116	116

Table 2: *Analysis of published papers from various centres. Some individual publications were from more than one centre. Other centres were: Whangarei (1), Hastings (1), Invercargill (2), Kaitaia (1), Blenheim (2), Hawera (2), Oamaru (1), Tokoroa (2), Thames (3), Tauranga (1), Dannevirke (1).*

In the last 15 years 293 persons were either first (or only) or co-author of 358 published papers; 204 of these persons subsequently did not publish again. Thus 89 persons have more than one publication in the journal over the last 15 years, and Table 4 shows who have continuously been contributing the most to the journal. Six persons contributed 6 times, 5 persons 5 times, 6 persons 4 times, 17 persons 3 times and 45 persons twice. There has been a tendency overseas for an increase in multiple authorship of published papers and this trend is evident also for the journal in New Zealand (see Table

	1972 to 1977	1977 to 1982	1982 to 1987
Hospital Laboratory	97 (77.0%)	97 (83.6%)	87 (75.0%)
Private Laboratory	17 (13.5%)	12 (10.3%)	4 (3.4%)
BTC Auckland	1 (0.8%)	3 (2.6%)	12 (10.3%)
NHI Wellington	4 (3.2%)	2 (1.7%)	6 (5.2%)
University Laboratory	0	3 (Massey)	1 (Hamilton)
Ruakura Hamilton	1	0	1
CIT Upper Hutt	0	0	1
Medical Schools:			
Auckland	3	1	2
Wellington	0	0	2
Dunedin	1	0	2

Table 3: *Analysis of the type of laboratory from where publications originated.*

Top 10 Published Authors 1972 to 1987

RJ Austin:	13	MJ Gratten:	9
M Legge:	13	DR Romain:	8
AE Knight:	12	RAM Anderson:	7
LM Milligan:	10	BM Cornere:	7
RWL Siebers:	10	TA Walmsley	7

1972-1977:	M Gratten (8)
1977-1982:	M Legge (7)
1982-1987:	L Milligan (8)

Table 4: *Most prolific authors (either main or co-author) of published articles in the NZ J Med Lab Technol.*

No. of authors per paper	1972 to 1977	1977 to 1982	1982 1987
1	102 (81%)	82 (72%)	58 (50%)
(Multiple)	24 (19%)	34 (28%)	58 (50%)
2	20	22	44
3	2	9	11
4	1	1	3
5	1	2	0

Table 5: *Comparison of single versus multiple authorship of publications.*

5). In the last five years only 50% of published papers were by single authors while, of the multiple authorship papers, the majority were by two authors.

This article has attempted to analyse any emerging trends occurring in papers published in the NZ Journal of Medical Laboratory Technology over the last 15 years. It is hoped that it may stimulate persons and/or certain centres to consider making a contribution towards the journal in order to correct any anomaly that may be apparent from the results. Perhaps certain centres will submit papers to boost their region's output, or biochemists might think about submittance to stop the decline in published biochemistry oriented papers. The thoughts and conclusions within this paper are entirely the author's, and any such errors or omissions as may have occurred.

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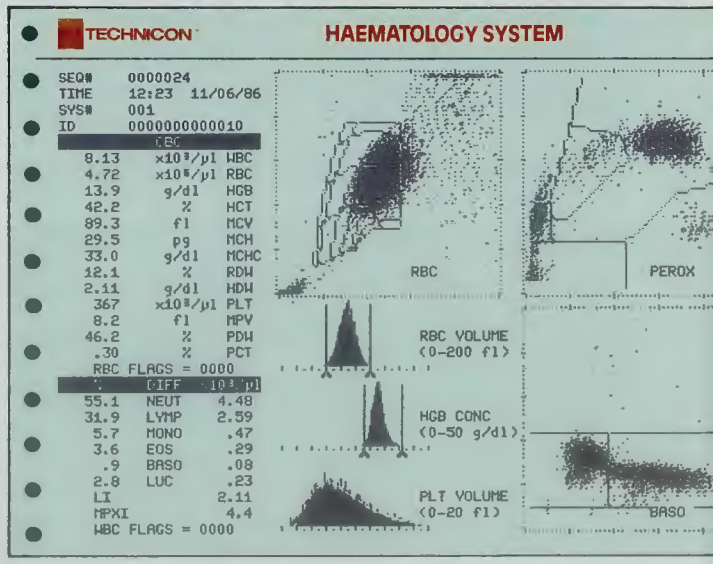

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Pacific Paramedical Training Centre

Annual Report

The sixth year in the life of the Centre has now been completed. It has been a year of continued development in which twenty-nine trainees have attended courses. A course in basic clinical chemistry has been developed and run for the first time, and a quality control programme for the clinical laboratories for the Pacific Region has been established. The quality control programme functions on a thrice yearly basis in the disciplines of microbiology and haematology and the clinical chemistry programme is to begin early next year.

The annual report provides an opportunity for the Committee of the Centre to record appreciation to all of the individuals and organisations who have given so generously of time, technical expertise and material resources.

To the Ministry of Foreign Affairs thanks are once again extended, not only for the aid grant which enables the Centre to function, but also to the Executive and Project Officers of the External Aid Division for the continued interest and guidance they have afforded the Centre in its activities over the past year. For direction and encouragement thanks must go to the Western Pacific Office and Suva Office of the World Health Organisation.

As well as financial resources, the Centre required a continuing flow of trainees for the various courses and, for assistance in this direction, the thanks of the Committee go to the Executive Officers of the International Dvision of the New Zealand Department of Health. Attention must also be made of the co-ordinating role that the International Division play between the Centre, the Ministry of Foreign Affairs, WHO and the numerous overseas health ministries with which the Centre deals. This function is an ongoing one by the International Division and is greatly appreciated by the Committee and trainees alike.

Special thanks are extended to the Wellington Hospital Board for the use of the teaching laboratory area and for help and co-operation in so many ways over the past year. In addition the Committee would like to record its appreciation to the many staff members at Wellington Hospital for kindness and acts of friendship to the trainees who stayed on campus during 1986/87.

We are indebted to the Federation of University Women for making the grant that enabled Matauoanoa Pepe, a laboratory technician from the Cook Islands, to attend the February/May 1987, Haematology/Blood Bank Technology Course. Similarly, we are pleased to record our thanks to the League of Red Cross and Red Crescent Societies based in Geneva for awards which made it possible for two trainees to attend Haematology/Blood Bank Technology Courses.

In previous annual reports thanks have been expressed to the New Zealand Red Cross Society for valuable assistance. This year is no exception, and indeed it is with an even greater sense of appreciation that the Committee extend thanks to the Society, not only for the two Health Science Scholarships which are funded annually, but also for the logistical and administrative support which comes so readily from the National Headquarters staff and enables the Centre to operate smoothly. Thanks, too, are given to the Wellington Regional Centre of the New Zealand Red Cross Society for organising the comprehensive First Aid Courses which have become one of the essential components of the PPTC training programmes.

The Centre is grateful to the New Zealand Institute of Medical Laboratory Technology for continued interest and, in particular, for the grant covering the establishment of a quality control programme for the clinical laboratories of the Pacific Islands. During the past year a number of clinical laboratories throughout New Zealand have continued to donate useful items of equipment for use in the teaching laboratory. These donations have been most useful and, where equipment has been duplicated or not required, the Centre, with the assistance of Red Cross, has been sending it to the Pacific Island laboratories when a known need exists. During 1986/87 equipment has been sent to Vanuatu, Fiji, Papua New Guinea and further afield to the Rewi Alley School in China. In addition to the material assistance afforded the Centre by the NZIMLT, the Committee are grateful to those Wellington based technologists who have contributed so generously with their time and expertise in a teaching capacity over the past year.

Chemistry Course — June-August 1987
Back Row (left to right): Havila Kavo (Papua New Guinea), Mike Lynch (Tutor Co-ordinator), Ron Mackenzie (Chairman, PPTC Steering Committee, Nathan Rioco (Solomons).
Front Row: Meleaone Tumii (Cook Islands), Dr Joan Mattingley (Course Tutor), Violine Aruafu (Solomons), Naomi Samuelu (Western Samoa).

The Centre would like to take the opportunity on the presentation of this report to acknowledge with thanks the continued interest of the Norman Kirk Memorial Trust in the work of the Centre. We were particularly grateful for a grant during the year which enabled the purchase of equipment required for the teaching of hepatitis screening and other diagnostic serology.

In conclusion, the appreciation of the Committee goes to Mr Michael Lynch, Tutor Co-ordinator of the Centre, for his efforts over the 1986/87 period. Mr Lynch's efforts in putting together the lecture series and playing a very active role as lecturer, demonstrator and solver of problems has been greatly

appreciated by the Committee and trainees alike.

Finally, to all staff in the Department of Laboratory Servies at Wellington Hospital who contributed to the PPTC during 1986/87, the Committe extend their sincere thanks.

Facilities and Equipment

The equipment in the teaching laboratory remains in good order and only minor repairs were required over the past year. In addition to various pieces of equipment which were kindly donated to the Centre by individual clinical laboratories, the acquisition of automatic pipettes and dispensers for use in the hepatitis testing programme per favour of the Norman Kirk Memorial Trust was of particular note. A new and larger white board has replaced the old one in the lecture room and the projector screen has been re-located. Apart from these minor alterations, no problems were encountered with the teaching facilities over the past year.

Visitors to the Centre

There have been a number of visitors to the Centre this year: We were pleased to welcome His Excellency, Mr Satyanand, High Commissioner for Fiji, who presented Certificates to trainees who had completed the May-July 1986 Haematology/Blood Bank Technology Course. On August 18th, 1986 we had the pleasure of a visit from Dr Lu Rushan, Assistant Director, World Health Organisation, Geneva. Dr Rushan was accompanied by Mrs Margaret Chamberlain, Executive Officer, International Health Division. In September 1986 we were pleased to welcome to the Centre two senior Government officials from the Federated States of Micronesia. They were: Mr Masao Nakayama, Head of International Affairs (Foreign Affairs) and Mr Paul Gallen, Head of Training, Ministry of Foreign Affairs, FSM.

On November 21st 1986, Mr Iareta Short, Cook Island Representative in New Zealand, visited the Centre and presented the trainee Certificates at a function marking the conclusion of the 1986 Medical Microbiology Course. A visit from the Hon. Richard Prebble to present Certificates at the conclusion of the February-May 1987 Haematology/Blood Bank Technology Course was an occasion enjoyed by trainees and guests. Earlier this year we were pleased to receive a visit from Mr Shu Zhang, Cultural Attache, Embassy of the People's Republic of China, and discuss the various training programmes offered by the Training Centre.

On August 21st, 1987, a Certificate presentation was held to mark the completion of the first Basic Clinical Chemistry Course. On this occasion we were pleased to welcome Dr Karen Poutasi, Chief Health Officer, New Zealand Department of Health, who presented the trainee awards.

In addition to these visitors to the PPTC, we have had visits from representatives of various Pacific Island groups and people who are interested in our concept of appropriate medical laboratory technology for developing countries. Members of the Committee have also taken the opportunity to speak to a variety of organisations on the Centre's work.

In concluding this brief outline of the Centre's activities over the past year, the Committee would like to welcome those present at this Sixth Annual Meeting and welcome any ideas that may enhance the work of the Centre in the next year of operation.

Trainees who completed Courses at the Pacific Paramedical Training Centre May 1986 — August 1987.

Rajendra Singh, Fiji (NZ Overseas Development Aid), Haematology/Blood Bank Technology, May-July, 1986.

Berenadeta Soso, Fiji (NZ Overseas Development Aid), Haematology/Blood Bank Technology, May-July, 1986.

Teikori Kautabu, Kiribati (WHO Fellow), Haematology/Blood Bank Technology, May-July, 1986.

Fetuao Tavai, Western Samoa (NZ Overseas Development Aid), Haematology/Blood Bank Technology, May-July, 1986.

Sarol Taitibe, Papua New Guinea (NZ Red Cross), Haematology/Blood Bank Technology, May-July, 1986.

Jay Semah, Solomon Islands (NZ Overseas Development Aid), Haematology/Blood Bank Technology, May-July, 1986.

Premila Gupta, Fiji (NZ Overseas Development Aid), Haematology/Blood Bank Technology, May-July, 1986.

Meikopa Serere, Papua New Guinea (WHO Fellow), Haematology/Blood Bank Technology, May-July, 1986.

Tereapii Uka, Cook Islands (NZ Overseas Development Aid), Microbiology, Sept-Nov 1986

Baibuke Tauro, Kiribati (Overseas Development Aid), Microbiology, Sept-Nov 1986

Semiperive Ieremia, Western Samoa (Overseas Development Aid), Microbiology, Sept-Nov 1986

Gideon Ronolea, Vanuatu (Overseas Development Aid), Microbiology, Sept-Nov 1986

Brian Eniti, Solomon Islands (NZ Overseas Development Aid), Microbiology, Sept-Nov 1986

Wilfred Kiriau, Solomon Islands (NZ Overseas Development Aid), Microbiology, Sept-Nov 1986

Krypton Okesene, Niue (NZ Overseas Development Aid), Microbiology, November 1986

Filipaina Anesone, Western Samoa (Overseas Development Aid), Haematology/Blood Bank Technology, Feb-May, 1987.

Ellen Palang, Papua New Guinea (NZ Red Cross), Haematology/Blood Bank Technology, Feb-May, 1987.

Binod Mirdha, Nepal (League of Red Cross & Red Crescent Societies), Haematology/Blood Bank Technology, Feb-May, 1987.

Karotu Babiano, Kiribati (WHO Fellow), Haematology/Blood Bank Technology, Feb-May, 1987.

Matanoanoa Pepe, Cook Islands (Federation of University Women), Haematology/Blood Bank Technology, Feb-May, 1987.

Luisa Inocencio, Philippines (League of Red Cross & Red Crescent Societies), Haematology/Blood Bank Technology, Feb-May, 1987.

Geoffrey Stephens, Solomon Islands (NZ Red Cross), Haematology/Blood Bank Technology, Feb-May, 1987.

Misiona Nicholas, Niue (NZ Overseas Development Aid), Haematology/Blood Bank Technology, Feb-May, 1987.

Nathan Rioco, Solomon Islands (NZ Overseas Development Aid), Basic Clinical Chemistry, June-Aug, 1987.

Violine Aruafu, Solomon Islands (NZ Overseas Development Aid), Basic Clinical Chemistry, June-Aug, 1987

Meleaone Tumii, Cook Islands (NZ Overseas Development Aid), Basic Clinical Chemistry, June-Aug, 1987

Havila Karo, Papua New Guinea (NZ Overseas Development Aid), Basic Clinical Chemistry, June-Aug, 1987

Naomi Samuelu, Western Samoa (NZ Overseas Development Aid), Basic Clinical Chemisry, June-Aug, 1987

Areta Aritiera, Kiribati (NZ Overseas Development Aid), Extended Training Supervision, May 1982 - continuing.

Planned Courses for 1988

8th February — 29th April
Haematology/Blood Bank Technology

30th May — 22nd July
Sexually Transmitted Diseases (including AIDS) plus Hepatitis B Serology

29th August — 18th November
Microbiology (Diarrhoeal Diseases, Acute Respiratory Infection, Mycobacterial Infections).

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Signed: _____ Date: _____

N.Z.I.M.L.T. Computer No.

Safety Report

Explosion involving Liquid N_2 and a Thermos Flask (Brand: Thermos)

Laboratory Use:

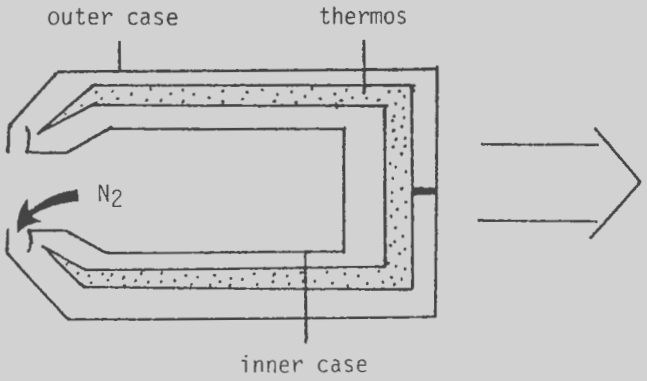
The thermos was used to hold liquid nitrogen as part of one of the procedures to freeze thaw cells. Every ½ hour or so liquid N_2 was dispensed from the thermos into another smaller plastic container which held the test tubes. The flask containing the liquid N_2 was not capped at any stage.

Description of Events Leading to Failure:

On the third occasion that the liquid N_2 was decanted, the flask was picked up and tilted to pour out liquid N_2. As none came out, I assumed it had all evaporated although some vapor was still present. While holding the flask horizontally a loud hissing noise, much like gas escaping from a cylinder, was heard to be coming from the flask which I moved out to arms length while still holding horizontally The hissing lasted 1-2 seconds and was followed by a loud bang. I assumed the evacuated flask had broken inside the casing but then noticed glass all over the bench and floor and that the plastic bottom of the thermos had been blown out. Glass and plastic was strewn over a large area with no pieces larger than 1-1½cm² remaining. The glass in the middle of the bench was encrusted in ice, which quickly vaporised.

Explanation:

It appears that during the pouring procedures liquid N_2 had seeped between the outer and inner castings of the thermos. This rapidly vaporised building up extreme pressure inside the thermos case and causing the blow out of the bottom. Fortunately the inner lining of the thermos remained intact.



Recommendation:

On discussion this type of accident is not unusual and the strongest recommendation needs to be made for the purchase of a purpose built container if liquid nitrogen is being used in the laboratory. These can be obtained locally and vary in price from $150 for a 500ml Dura flask (Lab Supply Pierce) to $670 for a 3L Cryogenic Container from National Dairy Association.

G Harrison
Department of Medicine
4th Floor
Auckland Hospital

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Membership Convenor
David Pees
P.O. Box 29-115, Greenwoods Cnr, Auckland.

Membership Fees and Enquiries

Membership fees for the year beginning April 1, 1988 are:

For Fellows — $104.00 GST inclusive

For Associates — $104.00 GST inclusive

For Members — $52.00 GST inclusive

For Non-practising Members — $33.00 GST inclusive

All membership fees, changes of address or particulars, applications for membership or changes in status should be sent to the Membership Convenor at the address given above.

Members wishing to receive their publications by airmail should contact the Editor to make the necessary arrangement.

1987 NZIMLT SCHOLARSHIP WINNER

Jan Nelson of the Department of Immunobiology, School of Medicine, Auckland Hospital was the 1987 winner of the NZIMLT scholarship. It will be used to assist Jan to attend the International Society of Haematology meeting in Milan in August.

Jan is a Fellow of the Institute and has had 15 papers published. Her main interest is in the classification and diagnosis of leukaemia and lymphoma by immunological, ultrastructural.and molecular techniques.

CORRESPONDENCE

Mr Barrie Edwards
Secretary
NZ Institute of Medical Laboratory Technology (Inc.)
C/- Haematology Department
Christchurch Hospital

Dear Sir,

At the last meeting of the New Zealand Society of Haematology it was suggested that New Zealand should have a representative on the Committee advising and administering the Haematology Quality Assurance Programme of the Royal College of Pathologists of Australasia. My name was put forward and I have subsequently been invited by the Chairman, Dr Wilbur Hughes of Sydney, to join the committee. I am writing to you so that you may notify your members that they may channel complaints or suggestions concerning this to myself. There apparently has been a complaint from New Zealand that the programmes contain too few bone marrows. We now have the chance to rectify this. I invite anyone with cases of some haematological interest to submit 600 stained slides of the appropriate bone marrow spread, trephine or blood film to me.

Yours sincerely,

David Heaton
CONSULTANT HAEMATOLOGIST
CHRISTCHURCH HOSPITAL

Membership Sub-Committee Report — November 1987

Since our September meeting there have been the following changes:

	19.11.87	22.9.87	18.8.87	27.5.87
Memberships:	1534	1524	1512	1536
less resignations	10	6	13	35
less G.N.A.	28	-	10	22
less deletions	-	-	-	-
less deceased	-	-	-	-
	1496	1518	1489	1479
plus applications	10	15	31	31
plus reinstatements	-	1	4	2
	1506	1534	1524	1512

Applications for Membership

Mrs Sarojini KRISHNA, Fiji; Mr Paul SKILLING, Auckland; Miss Nicola EVANS, Napier; Miss Julia MARSHALL, Lower Hutt; Mrs Verena SEATH, Kawakawa; Mr Charles HAWES, Christchurch.

Applications for Associateship

Mrs Anne MACCARTHY, Auckland; Mr Cornelus DIRVEN, Auckland; Mrs Stella HADFIELD, Auckland; Mr Eric GEORGE, Kawakawa.

Resignations

Mrs B. HEATON, Auckland; Mrs A. MEREDITH, Tauranga, Miss S. STRAWBRIDGE, Richmond; Mrs S. FEELEY, Auckland, Mrs B. GLASS, Dunedin, Mrs J. VENNELL, Auckland; Mr R. Douglas, Australia, Miss E. MASON, Morrinsville; Mrs J. BROWN, Lower Hutt.

Gone, No Address

Miss N. ROBINSON, Auckland; Mrs J. ROSS, Auckland; Mrs J. EDWARDS, Auckland; Mrs J. STREATER, Tauranga; Miss R. YOUNG, Auckland; Miss P. BEAZLEY, Lower Hutt; Miss M. GOSSE, Lower Hutt; Miss L. RUTENE, Wellington; Mrs C. SMITH, Wellington; Miss L. GREEN, Christchurch; Miss N. MELROSE, Christchurch; Miss L. BROWN, Hamilton; Mrs G. EDWARDS, Hamilton; Mrs M. HAWTHORNE, Hamilton; Miss A. HAYMANS, Hamilton; Miss M. GOUDIE, Hamilton; Mrs S. ANNAN, Hamilton; Miss R. DUN, Auckland; Mr K. JOHNSON, Auckland; Miss F. ANSLOW, Wellington; Mr C. HULL, Whangarei; Miss J. PRITCHARD, Auckland; Miss S. WALES, Auckland; Miss D. WALKER, Christchurch; Miss J. COOK, Whangarei; Miss R. MATTHEWS, Whangarei; Miss L. GOODMANSON, Whangarei; Miss C. RONALDS, Auckland.

Obituary

Gordon Roe George died suddenly on June 25, 1987. He was educated at the Rotorua Boys' High School and commenced his laboratory training in 1942 under Dr TH Pullar at the Palmerston North Hospital Laboratory. After qualifying (COP) in 1947, he moved to Rotorua to start up a laboratory at the Rotorua Public Hospital. It was not long before his expertise was in great demand — in fact 'Mr George' as he was known, was the laboratory. With his guidance and planning, a new laboratory was built and opened in 1958. This was a far cry from the one-roomed unit which was the laboratory until that time. The advent of a first Pathologist in 1961 led to a further upgrading of services. The rapidly accelerating changes in the Medical Sciences required many changes to methods, education, management and staff.

His innovation, caring, dedication and knowledge stimulated others about him to realise their goals and have pride in their work.

In 1960 he was on the Intermediate Examination Panel. He had published two papers on: "The Simplification of laboratory methods by the use of proprietory products" (1968) and "The expression of blood gas acid-base results" (1970) in the NZIMLT Journals. From 1962-1964 he was elected to the NZIMLT Council. In 1969 he served on The Council Negotiating Committee. He was made a Fellow of the Institute by order of Council in 1974.

Mr George continued in the forefront of events and new developments until his retirement in 1985.

Apart from his laboratory work, Gordon made time to enjoy boating and fishing, photography, tramping and outdoor life.

A course at the Technical Institute enabled him to rapidly master computers and these absorbed a great deal of his interest until his death.

He will be sadly missed by his friends and colleagues and people who valued his advice and encouragement.

We extend our deepest sympathy of his wife Florence and their daughters.

NEW PRODUCTS AND SERVICES

CHART RECORDERS: ANOTHER FIRST FROM EUROPE'S LEADER

LLOYD INSTRUMENTS PLC, Europe's leading manufacturer of flat-bed chart recorders, has launched an easy-to-use,

feature-packed Y/t recorder, the Graphic 450.

This instrument is very attractively priced and is the latest in a family of new recorders that have been introduced onto the market by Lloyd Instruments in recent months.

Says Keith Youle, Manager of the company's recorder division: "There are many establishments in the education, laboratory, medical and test field that need such a low-budget recorder. But they also require an instrument that is robust, technically advanced and portable for field use."

The Graphic 450 is probably the easiest-to-use recorder on today's market. From a technological standpoint, it incorporates the latest electronics, has 11 chart speeds, accuracy of ±0.5%, repeatability of ±0.1% and linearity of ±0.5%. Most pens, even the standard 'felt tip' can be used with the instrument to record an even on either roll or "Z" fold paper, (various lengths) with standard 250 mm graph width.

The Graphic 450's tough construction ensures optimum performance even in the most arduous conditions. Housed in a carrying case complete with battery and charger, the Graphic 450 is completely portable, weighing in at 3.5 kg.

"This is another example of the pioneering spirit of Lloyd Instruments in the recorder field" adds Youle. He points to a 15 year track record including innovative steps such as the introduction of the first recorder with an electronically controlled stepper motor to provide a wide range of chart speeds. That development was back in 1972. The company was also the first to use microchips in its recorder range... one incorporated a timing device and a two-phase drive for stepper motors; the other, an amplifier chip which was originally developed for hi-fi systems.

The brand name Graphic covers not only the new Graphic 450, but also four other models which have more features such as one or two pen operations and automatic pen lift.

Lloyd Instruments is a British-based transnational company with four divisions supplying materials testing machines, analytical instruments and educational systems which help students learn the concepts of electrical and electronic engineering. The company has subsidiaries in France, the Federal Republic of Germany and the United States and approved national distributors in 80 other countries.

Lloyd Instruments is represented in New Zealand by the Wiltons Instruments Division of Salmond Smith Biolab Ltd, phone (04) 697-099. **Circle 101 on readers reply card.**

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AXIOSKOP — The More-Than-Routine Microscope

Versatility, advanced optics, a beautiful design, are some characteristic points of the new Axioskop. This more-than-routine microscope is the newest member of the "Pyramid" series.

The Axioskop provides the essential advantages of the larger Axioplan and Axiophot microscopes but in a compact version. It offers infinity tube length ICS optics, and in addition to Plan Neofluar and Planapochromats a new Achrostigmat

objective has been developed which delivers crisp flatfield and glare-free images over a consistent 20 mm field of view.

Axioskop is specially geared to the requirement of higher level routine microscopy. Its system-integrated design allows rapid changes between different microscopic methods without compromising image quality or field of view and without having to purchase otherwise costly add-ons.

For more information please contact: Carl Zeiss (NZ) Ltd, Mayfair Chambers, The Terrace, Wellington. Phone 724-860 or 724-861 or **circle 103 on readers reply card.**

HUMAN INTERLEUKIN — 2

Genzyme USA have developed The Intertest 2 Human Interleukin — 2 — Elisa test. The test uses monoclonal antibody technology to measure, in vitro, biologically active natural and recombinant human Interleukin - 2 in human serum, plasma, culture supernatants and other biological fluids.

The Elisa test is highly sensitive and can measure as little as 50 picograms of hIL-2. Literature on the test procedure is available on request.

Contact Labsupply Pierce, PO Box 34-234, Auckland or **circle 104 on readers reply card.**

PESTLE FOR MICROSAMPLE TUBES

It is often difficult to resuspend lyophilized products or precipitates in 1.5 mL microsample tubes. With the Micro Centrifuge Sample Pestle it is easy to homogenize samples in the tubes. The pestle is made of Teflon and mounted on a stainless steel shaft with an overall length of 14.3 cm. The pestle is designed to fit into the microsample tube with 0.05 mm clearance and can be turned by hand or attached to a motor. Distributed by Kempthorne Medical Supplies Ltd, 79 Carlton Gore Road, Auckland. Telephone 775-289 **or cirlce 106 on readers reply card.**

HIGH QUALITY WATER

For ten years Chemtest Laboratories have manufactured and serviced Water Deionisers for a wide range of Industry groups and Laboratory applications.

Recently developments have allowed the system to become more modular giving advantages in cost effectiveness and flexibility of design. Now even the most varying of customer requirements can be fully met without sacrificing water quality.

Central, under bench or cabinet mounted systems for single or multiple workstations can be supplied. A wide mix of pressures and flow rates can be achieved. Options now available to compliment the system include removal of organics, submicron filtration and UV sterilization.

Once a system is installed it is easily serviced by way of exchange.

For further information please do not hesitate to contact John Thompson or Stephen French, Chemtest Laboratories, 58 Sir William Ave, East Tamaki, Auckland, phone (09) 274-5336 or **circle 116 on readers reply card.**

NEW DESIGN MAKES CLEAN BENCHES SAFER

A new streamlined design has produced laminar flow biological safety cabinets, clean benches, claimed to be the safest made in Australia.

Designed and manufactured in Australia by Email Westinghouse, the Airpure range of clean benches incorporates numerous safety features including quick release press studs with no sharp edges, low voltage easy-to-clean touch controls, a rear panel that clips in and out for easy cleaning and an ergonomically designed smooth-edged barrier air inlet grille that allows better airflow.

"We have started producing the new range unit in response to the urgent need for optimally safe clean benches, particularly in pathology labs and medical research establishments," explained John Nella, Manager of Email Westinghouse Air Filter Division.

"There is no doubt that the intensification of research into such diseases as AIDS, hepatitis and Legionnaire's Disease has boosted demand for the safest possible clean bench design, and we are proud to have been able to meet those requirements."

Mr Nella said that despite the doubling of production rates every year for the last four years, Email Westinghouse was able to keep up with the demand through expansion of the production facilities and actually provide faster delivery when required.

While most of the increase had come from the medical establishment, clean benches were also used more widely in universities, animal research establishments, in the semi-conductor and food manufacturing industries, by videotape packaging companies and even by orchid growers, he added.

The heart of the Airpure range of clean benches is the HEPA absolute type air filter also made by Email Westinghouse Pty Ltd which has a guaranteed minimum efficiency of 99.99 per cent by the HOT DOP test and is the only filter approved to the stringent AS1324 Australian Standard.

Other features include a pressure switch/alarm for the exhaust fan, smooth surface with no screws in the work zone, and a self-supporting work tray that can be rotated inside the cabinet for easy cleaning.

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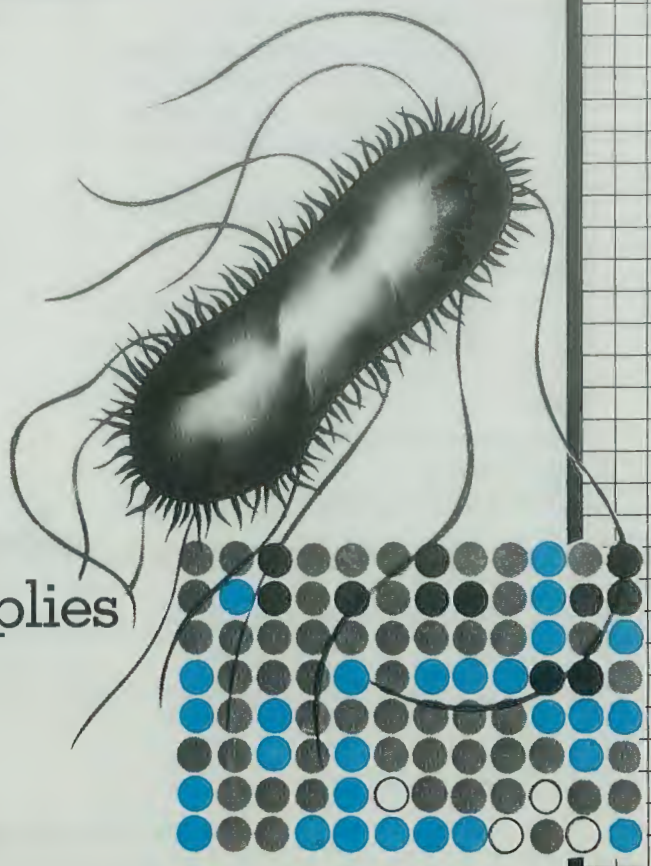

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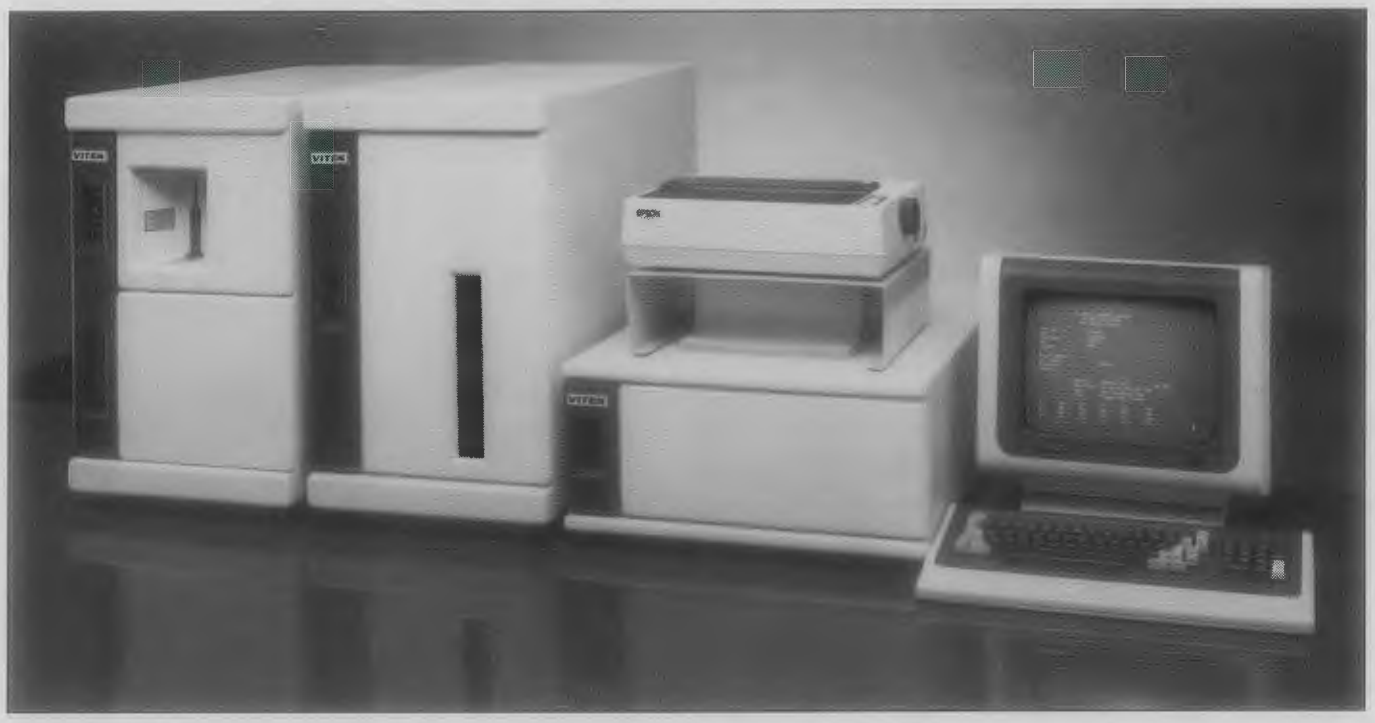

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Address: _____
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Tel Number: _____

Maurice Robertson
Vitek Systems Product Manager
Salmond Smith Biolab Ltd
Freepost 47
Private Bag Northcote, Auckland

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